

10/508926

5

DT15 Rec'd PCT/PTO 24 SEP 2004

NOT ENTERED

The first aspect of the present invention is to provide a drug delivery system, which includes a tank member of biodegradable material having a chamber, and at least one anchor member of biodegradable material extending from the tank member. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Therefore, according to the drug delivery system, the sharp tip thereof facilitates easy penetration into the tissue. Also, forming with biodegradable material such as poly-lactic acid and providing the anchor member with the protruding portions allow the drug delivery system to be placed within a body portion where a flow of blood and/or lymph is rapid, providing no harm to the body. In addition, as poly-lactic acid is slowly dissolves, it gently release the medicament held in the tank member in small doses for a predetermined dosing period. This achieves a safer treatment with less burden for a patient instead of the conventional invasive surgery operation.

The second aspect of the present invention is to provide a drug delivery system, which includes a plurality of tank members of biodegradable material, and each of the tank members has a chamber. It also includes a connector member of biodegradable material connecting adjacent tank members, a cap member arranged on the connector member for

hermetically sealing each of the tank members, and at least one anchor member of biodegradable material extending from the tank member. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Therefore, according to the drug delivery system, the sharp tip thereof facilitates easy penetration into the tissue. Also, forming with biodegradable material such as polylactic acid and providing the anchor member with the protruding portions allow the drug delivery system to be placed within a body portion where a flow of blood and/or lymph is rapid, providing no harm to the body. In addition, as polylactic acid is slowly dissolves, it gently release the medicament held in the tank member in small doses for a predetermined dosing period. Furthermore, a plurality of tank members allows the same or different kind of medicaments to release at different timings.

The third aspect of the present invention is to provide a drug delivery system, which includes an anchor member of biodegradable material having a chamber. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Thus, the drug delivery system can readily be penetrated into the tissue and placed within the body portion having rapid flow of blood or body fluid,

thereby to gently release the medicament held therein in small doses for a predetermined dosing period.

The fourth aspect of the present invention is to provide a drug delivery system, which includes a tank member of biodegradable material containing a medicament  
5 therein, and at least one anchor member of biodegradable material extending from the tank member. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different  
10 from one another. Thus, the drug delivery system can gently release the medicament contained in the biodegradable material such as poly-lactic acid in small doses.

The fifth aspect of the present invention is to provide a drug delivery system, which includes an anchor  
15 member of biodegradable material containing a medicament. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Thus, the drug delivery system  
20 can gently release the medicament contained in the biodegradable material such as poly-lactic acid in small doses.

The sixth aspect of the present invention is to provide a drug delivery system, which includes an anchor  
25 member of biodegradable material having a tip tapered at

one end in a longitudinal direction, and a mass of a medicament attached at the other end. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Thus, according to the drug delivery system, the mass of a medicament attached at the other end can be placed at the treatment portion.

The seventh aspect of the present invention is to provide a drug delivery system, which includes an anchor member of biodegradable material having a chamber. The anchor member has both ends tapered in a longitudinal direction, and has at least one protruding portion extending therefrom. Thus, the drug delivery system can gently release the medicament stored in the chamber in small doses for a predetermined dosing period.

Preferably, in the anchor member, a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another can easily be formed, for example by wet etching the silicon substrate with potassium hydroxide.

Preferably, the protruding portion extends towards a direction inclined to a longitudinal direction towards the tip at an obtuse angle. The protruding portion can easily be formed, for example by ion-reactive etching with sulfur hexafluoride.

## WHAT IS CLAIMED IS:

## 1. A medical device, comprising:

a tank member of biodegradable material having a chamber; and

5 at least one anchor member of biodegradable material extending from said tank member;

wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

10

## 2. A medical device, comprising:

a plurality of tank members of biodegradable material, each of said tank members having a chamber;

a connector member of biodegradable material  
15 connecting adjacent tank members;

a cap member arranged on said connector member for hermetically sealing each of said tank members; and

at least one anchor member of biodegradable material extending from said tank member;

20 wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

## 3. A medical device, comprising:

25 an anchor member of biodegradable material having a

chamber;

wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

5

4. A medical device, comprising:

a tank member of biodegradable material containing a medicament therein; and

10 at least one anchor member of biodegradable material extending from said tank member;

wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

15 5. A medical device, comprising:

an anchor member of biodegradable material containing a medicament; and

20 wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

6. A medical device, comprising:

25 an anchor member of biodegradable material having a tip tapered at one end in a longitudinal direction, and a mass of a medicament attached at the other end;

wherein said anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another.

5     7.    A medical device, comprising:

an anchor member of biodegradable material having a chamber;

10        wherein said anchor member has both ends tapered in a longitudinal direction, and has at least one protruding portion extending therefrom.

8.    (Deleted)

9.    The medical device according to Claim 7,

15        wherein the protruding portion extends towards a direction inclined to the longitudinal direction towards the tip at an obtuse angle.

20     10. The medical device according to either one of Claims 1 to 7,

wherein the biodegradable material includes polylactic acid, glue, starch, protein, or glucose.

11. The medical device according to Claim 1 or 2,

25        wherein said anchor member has a channel in fluid